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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of )  
Applicants: John F. Ranta et al. )  
Serial No. 09/970,071 ) Examiner  
Filed: October 3, 2001 ) Cameron Saadat  
Title: Methods and apparatus for simulating dental )  
procedures and for training dental students ) Art Unit 3713

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

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The attached INTERVIEW REPORT (3 pages) and AMENDMENT (7 pages) are being transmitted via facsimile to the central facsimile number of United States Patent and Trademark Office, (571) 273-8300, on August 24, 2006.

Respectfully submitted,



Dated: August 24, 2006

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Dear Sir:

**Interview Report**

This report is being submitted pursuant to 37 C.F.R. 1.133(b) to provide a complete written statement of the reasons warranting favorable action presented during the telephone interview between applicants' undersigned attorney and Examiner Saadat conducted today, August 24, 2006.

In the interview, the reasons for allowance of independent claims 1 and 19 that were advanced in the Amendment mailed on January 8, 2006 were summarized and discussed. Specifically, applicants' attorney pointed out that the Arnold publication does not teach storing data defining the locations of plural feel points at the surface of a model of a dental tool as well as data defining the surface of a model of a tooth, nor does Arnold describe using a processor to compare the locations of this tool model surface with tooth model surface to calculate and apply interaction forces to a force feedback stylus in order to simulate the feel of a dental tool and to haptically simulate a dental procedure. Applicant further pointed out that Arnold describes the

use of a force feedback stylus that specifies the location of a single feel point (which Arnold calls a "cursor") that can be moved in two dimensional space, but does not disclose modeling the surface of the tool with plural feel points, does not disclose displaying this model of the tool, and does not calculate and apply feedback forces to the stylus by comparing the location of the tool model surface defined by the feel points with surface of the tooth model.

Examiner Saadat noted that Arnold, at the section entitled "Conclusion and Future Work" at page 603, states that in the future "a new generation of 3D haptic feedback devices will be used so that the user can 'feel' as he sees the instrument being directed through the root canal." Applicants' attorney pointed out that this passage does not suggest that such "future work" would or should use plural feel points to model the surface of a tool or that feedback forces should be calculated and applied to the force feedback stylus based on a comparison of the relative locations of the surfaces of the tool and tooth models as claimed. Instead, Arnold appears to suggest nothing more than the use of the same single point cursor, except that possible future haptic feedback devices would be movable in three dimensions (that is, in a depthwise direction in addition to the left-right, up-down two dimensional movement of the PenCat stylus point), thereby enabling the user to "feel" the bumps and ridges as the user directs the single point cursor through a root canal. Thus, the "future work" proposed falls far short of suggesting the use of a tooth model composed of plural feel points claimed by applicants.

Applicants' attorney again pointed out that the Tarr reference, which does disclose a mechanism for modeling a haptic tool as a plurality of discrete points and using that tool to deform a virtual surface in a virtual environment, is not concerned with and does not mention dentistry or teach the use of such techniques in a dental training system as claimed.

In the interview, applicants' attorney noted that independent claim 19 in its current form does not recite that the tool model includes a handle, an important feature discussed in the Amendment filed on January 8, 2006. Applicants' attorney indicated that claim 19 would be amended to include that limitation so that the arguments regarding the handle that were advanced in the prior Amendment with respect to independent claim 1 would also be applicable to independent claim 19 as amended. An amendment to claim 19 adding this limitation is accordingly being submitted concurrently with this Interview Report.

Respectfully submitted,



Dated: August 24, 2006

Charles G. Call, Reg. 20,406

**Certificate of Transmission under 37 CFR 1.8**

I hereby certify that this Interview Report is being transmitted by facsimile to the central facsimile number of the U.S. Patent and Trademark Office, 1-571-273-8300, on August 24, 2006.



Dated: August 24, 2006

Signature

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